

Air-Conditioners For Building Application

INDOOR UNIT

PKFY-P·VFM-E

For use with the R410A, R407C & R22 Για χρήση με τα R410A, R407C και R22
Bei Verwendung von R410A, R407C & R22 Para utilização com o R410A, R407C e o R22
A utiliser avec le R410A, R407C et le R22 R410A, R407C ve R22 ile beraber kullanmak için
Bij gebruik van R410A, R407C & R22 Для использования с моделями R410A, R407C и R22
Para utilizar con el R410A, R407C y el R22 使用R410A, R407C和R22制冷剂
Uso del refrigerante R410A, R407C e R22

INSTALLATION MANUAL

For safe and correct use, please read this installation manual thoroughly before installing the air-conditioner unit.

FOR INSTALLER

INSTALLATIONSHANDBUCH

Zum sicheren und ordnungsgemäßen Gebrauch der Klimaanlage das Installationshandbuch gründlich durchlesen.

FÜR INSTALLATEURE

MANUEL D'INSTALLATION

Veuillez lire le manuel d'installation en entier avant d'installer ce climatiseur pour éviter tout accident et vous assurer d'une utilisation correcte.

POUR L'INSTALLATEUR

INSTALLATIEHANDLEIDING

Voor een veilig en juist gebruik moet u deze installatiehandleiding grondig doorlezen voordat u de airconditioner installeert.

VOOR DE INSTALLATEUR

MANUAL DE INSTALACIÓN

Para un uso seguro y correcto, lea detalladamente este manual de instalación antes de montar la unidad de aire acondicionado.

PARA EL INSTALADOR

MANUALE DI INSTALLAZIONE

Per un uso sicuro e corretto, leggere attentamente questo manuale di installazione prima di installare il condizionatore d'aria.

PER L'INSTALLATORE

ΕΓΧΕΙΡΙΔΙΟ ΟΔΗΓΙΩΝ ΕΓΚΑΤΑΣΤΑΣΗΣ

Για ασφάλεια και σωστή χρήση, παρακαλείστε διαβάσετε προσεκτικά αυτό το εγχειρίδιο εγκατάστασης πριν αρχίσετε την εγκατάσταση της μονάδας κλιματισμού.

ΓΙΑ ΑΥΤΟΝ ΠΟΥ ΚΑΝΕΙ ΤΗΝ ΕΓΚΑΤΑΣΤΑΣΗ

MANUAL DE INSTALAÇÃO

Para segurança e utilização correctas, leia atentamente este manual de instalação antes de instalar a unidade de ar condicionado.

PARA O INSTALADOR

MONTAJ ELKİTABI

Emniyetli ve doğru biçimde nasıl kullanılacağını öğrenmek için lütfen klima cihazını monte etmeden önce bu elkitabını dikkatle okuyunuz.

MONTÖR İÇİN

РУКОВОДСТВО ПО УСТАНОВКЕ

Для осторожного и правильного использования прибора необходимо тщательно ознакомиться с данным руководством по установке до выполнения установки кондиционера.

ДЛЯ УСТАНОВИТЕЛЯ

安装说明书

在安装空调机之前，请先通读此安装说明书，以便安全正确地使用。

安装人员适用**English****Deutsch****Français****Nederlands****Español****Italiano****Ελληνικά****Português****Türkçe****Русский****中文**

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1. Safety precautions

▶ Before installing the unit, make sure you read all the "Safety precautions".
 ▶ Please report to your supply authority or obtain their consent before connecting this equipment to the power supply system.

Warning:
 Describes precautions that must be observed to prevent danger of injury or death to the user.

Caution:
 Describes precautions that must be observed to prevent damage to the unit.

After installation work has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in the Operation Manual and perform the test run to ensure normal operation. Both the Installation Manual and Operation Manual must be given to the user for keeping. These manuals must be passed on to subsequent users.

- Warning:**
- Ask the dealer or an authorized technician to install the air conditioner.
 - Install the unit at a place that can withstand its weight.
 - Use the specified cables for wiring.
 - Use only accessories authorized by Mitsubishi Electric and ask the dealer or an authorized technician to install them.
 - Do not touch the heat exchanger fins.
 - Install the air conditioner according to this Installation Manual.

- Caution:**
- Do not use the existing refrigerant piping, when use R410A or R407C refrigerant.
 - Use ester oil, either oil or alkylbenzene (small amount) as the refrigerator oil to coat flares and flange connections, when use R410A or R407C refrigerant.
 - Do not use the air conditioner where food, pets, plants, precision instruments, or artwork are kept.
 - Do not use the air conditioner in special environments.

2. Installation location

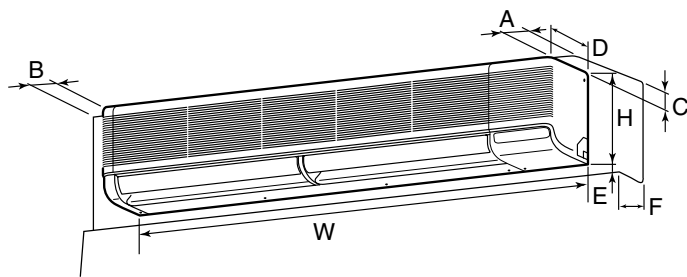


Fig. 2-1

- ⊘ : Indicates an action that must be avoided.
- ⚠ : Indicates that important instructions must be followed.
- ⚡ : Indicates a part which must be grounded.
- ⚠ : Indicates that caution should be taken with rotating parts.
- ⚠ : Indicates that the main switch must be turned off before servicing.
- ⚠ : Beware of electric shock.
- ⚠ : Beware of hot surface.
- ⚠ ELV: At servicing, please shut down the power supply for both the Indoor and Outdoor Unit.

Warning:
 Carefully read the labels affixed to the main unit.

- Have all electric work done by a licensed electrician according to local regulations.
- If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.
- The cut face punched parts may cause injury by cut, etc. The installers are requested to wear protective equipment such as gloves, etc.
- Ground the unit.
- Install an leak circuit breaker, as required.
- Use power line cables of sufficient current carrying capacity and rating.
- Use only a circuit breaker and fuse of the specified capacity.
- Do not touch the switches with wet fingers.
- Do not touch the refrigerant pipes during and immediately after operation.
- Do not operate the air conditioner with the panels and guards removed.
- Do not turn off the power immediately after stopping operation.

The indoor unit should be supplied with the following accessories.

PARTNUMBER	ACCESSORY	QUANTITY	LOCATION OF SETTING	
①	Wall-fixing bracket	1	Fix at the back of the unit	
②	Tapping screw 4 × 35	12	Set inside the unit	
③	Insulation material	2		
④	Band	4 (large) + 3 (small)		
⑤	Felt tape	3		
⑥	Drain socket	1		
⑦	Wireless remote controller	1		
⑧	Remote controller holder	1		
⑨	Alkali batteries	2		
⑩	Flare nut	P100		1 (ø19.05)

2.1. Outline dimensions (Indoor unit) (Fig. 2-1)

Select a proper position allowing the following clearances for installation and maintenance.

(mm)

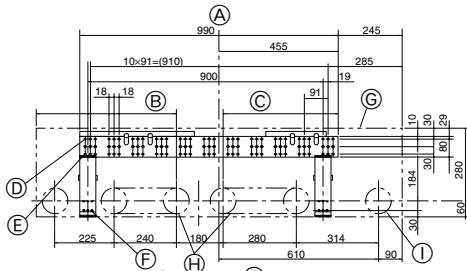
Models	W	D	H	A	B	C	E	F
P63	1400	235	340	Min. 150	Min. 50	Min. 30	Min. 250	Min. 150
P100	1680	235	340	Min. 150	Min. 50	Min. 30	Min. 250	Min. 150

Warning:
 Mount the indoor unit on a ceiling strong enough to withstand the weight of the unit.

3. Installing the indoor unit

1 P63

(mm)



2 P100

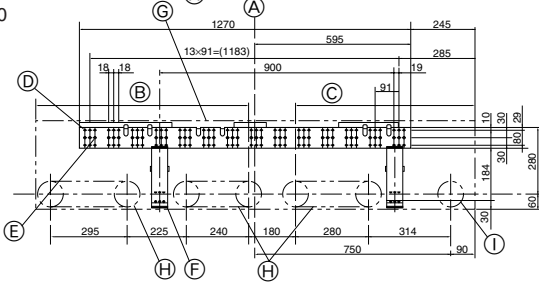


Fig. 3-1

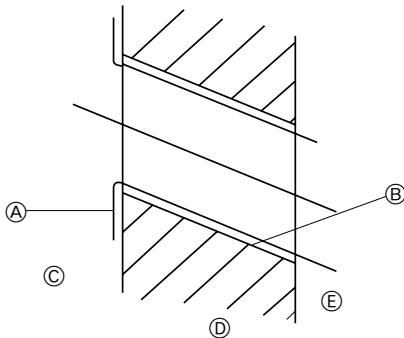
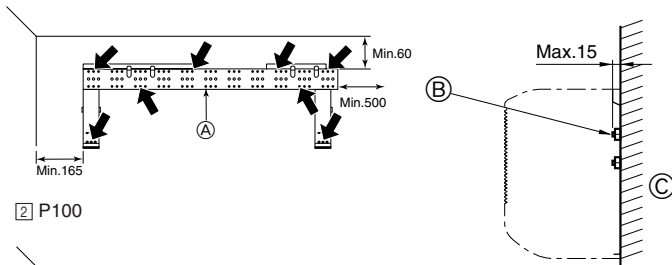


Fig. 3-2

1 P63



2 P100

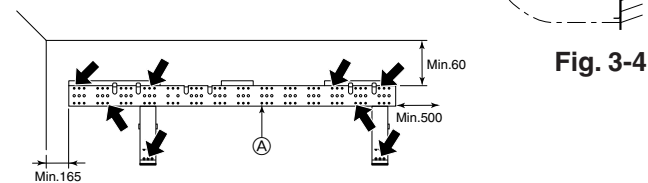


Fig. 3-3

Fig. 3-4

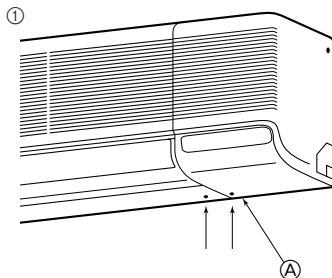


Fig. 3-5

3.1. Installing the wall mounting fixture (Fig. 3-1)

1) Setting the wall mounting fixture and piping positions

- ▶ Using the wall mounting fixture, determine the unit's installation position and the locations of the piping holes to be drilled.

⚠ Warning:

Before drilling a hole in the wall, you must consult the building contractor.

- Ⓐ Indoor unit center line
- Ⓑ Left drain range
- Ⓒ Right drain range
- Ⓓ Hole for tapping screw
- Ⓔ Bolt hole
- Ⓕ Hole for tapping screw
- Ⓖ Contour of the unit
- Ⓗ Knockout hole for left rear piping
- Ⓘ Rear piping access hole (90-100 mm dia.)

2) Drilling the piping hole (Fig. 3-2)

- ▶ Use a core drill to make a hole of 90-100 mm diameter in the wall in the piping direction, at the position shown in the diagram to the left.
- ▶ The hole should incline so that the outside opening is lower than the inside opening.
- ▶ Insert a sleeve (with a 90 mm diameter and purchased locally) through the hole.

Note:

The purpose of the hole's inclination is to promote drain flow.

- Ⓐ Sleeve
- Ⓑ Hole
- Ⓒ (Indoors)
- Ⓓ Wall
- Ⓔ (Outdoors)

3) Installing the wall mounting fixture

- ▶ Since the indoor unit weighs near 30 kg, selection of the mounting location requires thorough consideration. If the wall does not seem to be strong enough, reinforce it with boards or beams before installation.
- ▶ The mounting fixture must be secured at both ends and at the centre, if possible. Never fix it at a single spot or in any nonsymmetrical way. (If possible, secure the fixture at all the positions marked with a bold arrow.) (Fig. 3-3)
- ▶ Secure the wall mounting fixture through its middle row of 12-mm-dia. holes using locally purchased bolts (through bolts, bolt anchor and nut anchor) of M10 or W3/8 threading. The bolt tip must not protrude by more than 15 mm from the wall surface. (Fig. 3-4)
- ▶ Use at least two bolts for a concrete wall, and at least four bolts for a foamed concrete wall.

- Ⓐ Wall-fixing bracket
- Ⓑ Mounting bolt
- Ⓒ Wall

⚠ Warning:

If possible, secure the fixture at all the positions marked with a bold arrow.

⚠ Caution:

The unit body must be mounted horizontally.

3.2. Preparation for piping connection

Remove the vinyl band that holds the drain piping.

- This vinyl band can be used to temporarily attach the pipes to the wall mounting fixture while connecting the left pipe.

1) Rear, right and lower piping (Fig. 3-5)

- ① Remove the right side panel.

2) Left and left rear piping

- ① Remove the side panel.

3. Installing the indoor unit

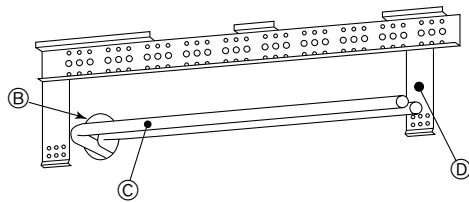


Fig. 3-6

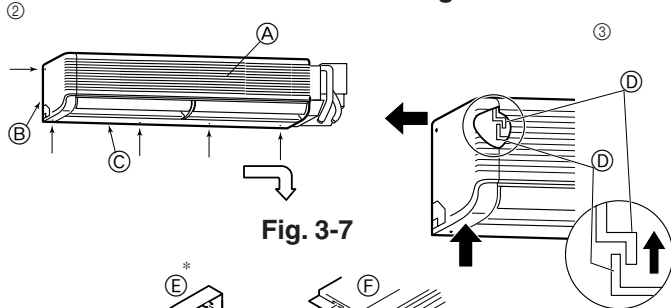


Fig. 3-7

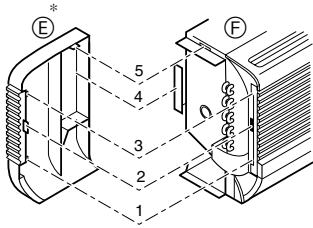


Fig. 3-8

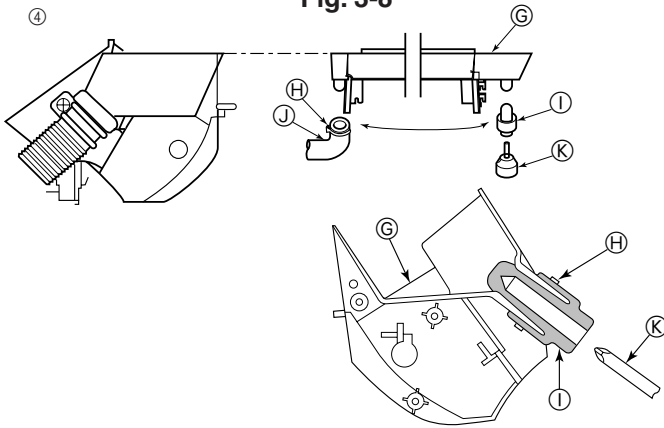


Fig. 3-9

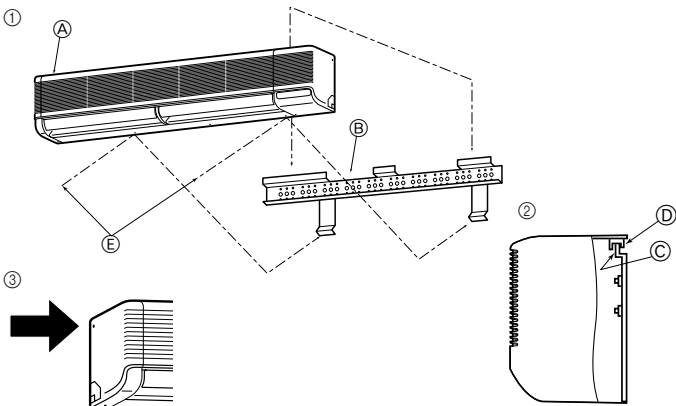


Fig. 3-10

When embedding pipes into the wall (Fig. 3-6)

When the refrigerant pipe, drain pipes, internal/external connection lines, etc., are to be embedded into the wall in advance, the extruding pipes, etc., may have to be bent and have their length modified to the unit.

- Make the pipes to be embedded slightly longer than necessary, and install.
 - Ⓐ Right side panel
 - Ⓑ Through hole
 - Ⓒ On-site piping
 - Ⓓ Wall-fixing bracket ①

- ② Remove the five screws indicated by the arrows in the diagram. (Fig. 3-7)

- ③ Remove the left side panel, then the lower panel.

- 1. While pushing up the front lower portion of the side panel (to disengage the side panel catch from the unit catch), slide the upper portion of the side panel to the left.

- When the indoor unit is already mounted, be sure the unit does not fall from the wall mounting fixture.

- For reassembly, put the catch at the front lower portion of the side panel over the unit body and push it to the right.

- Ⓐ Grille
- Ⓑ Left side panel
- Ⓒ Lower panel
- Ⓓ Catch
- Ⓔ Side panel
- Ⓕ Unit body

* Structure of the side panel and the unit body (Fig. 3-8)

1. Panel catch engages the unit body catch.
2. Panel catch is put in the unit body hole.
3. Panel catch engages the unit body catch.
4. Sheet metal of the unit body enters the panel.
5. Panel catch enters the unit body hole.

- ④ The drain hose can be connected at two different positions. Use the most convenient position and, if necessary, exchange the position of the drain pan, rubber plug and the drain hose. (Fig. 3-9)

- Ⓒ Drain pan
- Ⓓ Band
- Ⓔ Plug
- Ⓕ Drain hose
- Ⓖ Screwdriver

3.3. Mounting the indoor unit (Fig. 3-10)

- ① Make sure to hang the metal catches of the indoor unit over the hooks of the wall mounting fixture.

- ② When the piping has been completed, use the securing screws to fix the indoor unit on the wall mounting fixture.

Note:

Check that the catches of the indoor unit securely fit over the hooks of the wall mounting fixture.

- ③ The screw indicated by the bold arrow is used only during transportation and should be removed. Remove the screw before installation if there is not enough space at the left side to remove it once the unit has been installed.

- Ⓐ Indoor unit
- Ⓑ Wall fixing bracket ①
- Ⓒ Hook
- Ⓓ Metal catch of the indoor unit
- Ⓔ Securing screws

4. Refrigerant pipe

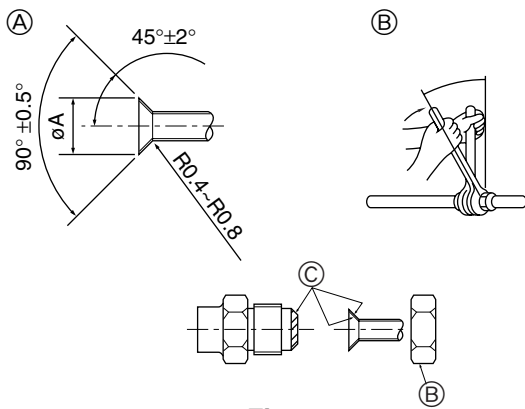


Fig. 4-1

Refrigerant pipe sizes & Flare nut tightening torque

	R407C or R22				R410A				Flare nut O.D.	
	Liquid pipe		Gas pipe		Liquid pipe		Gas pipe		Liquid pipe (mm)	Gas pipe (mm)
	Pipe size (mm)	Tightening torque (N.m)	Pipe size (mm)	Tightening torque (N.m)	Pipe size (mm)	Tightening torque (N.m)	Pipe size (mm)	Tightening torque (N.m)		
P20/25/32/40	ODø6.35 (1/4")	14 - 18	ODø12.7 (1/2")	49 - 61	ODø6.35 (1/4")	14 - 18	ODø12.7 (1/2")	49 - 61	17	26
P50	ODø9.52 (3/8")	34 - 42*	ODø15.88 (5/8")	68 - 82*	ODø6.35 (1/4")	34 - 42	ODø12.7 (1/2")	68 - 82	22	29
P63/80	ODø9.52 (3/8")	34 - 42	ODø15.88 (5/8")	68 - 82	ODø9.52 (3/8")	34 - 42	ODø15.88 (5/8")	68 - 82	22	29
P100/125	ODø9.52 (3/8")	34 - 42	ODø19.05 (3/4")	100 - 120*	ODø9.52 (3/8")	34 - 42	ODø15.88 (5/8")	100 - 120	22	36

* Use the provided flare nut for the following pipes: Liquid pipe of P50, gas pipe of P50, P100, and P125.

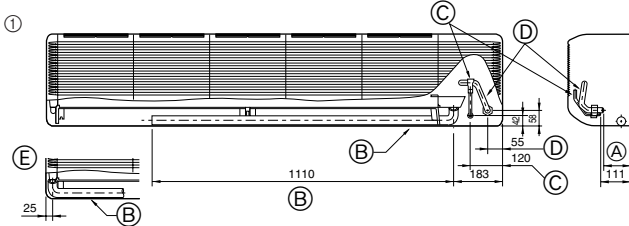


Fig. 4-2

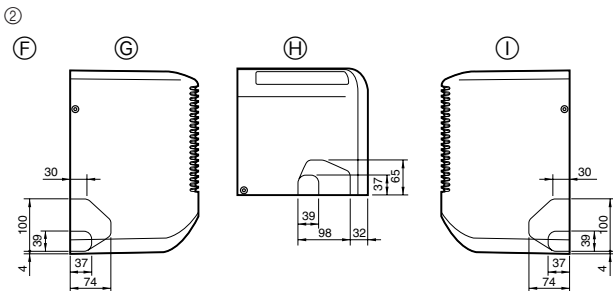


Fig. 4-3

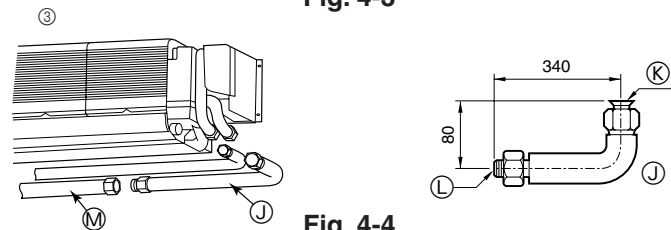


Fig. 4-4

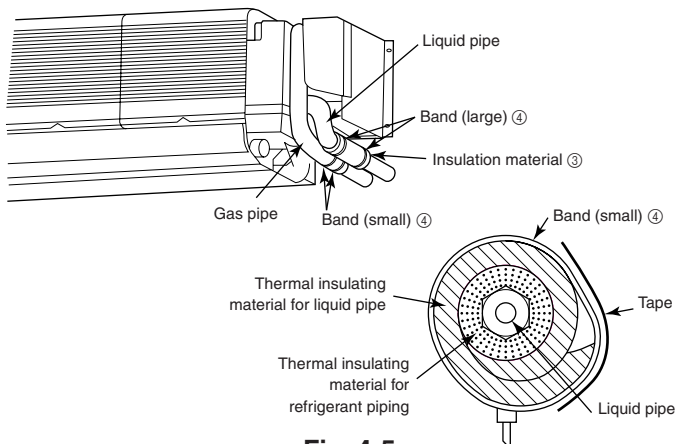


Fig. 4-5

4.1. Connecting pipes (Fig. 4-1)

- When commercially available copper pipes are used, wrap liquid and gas pipes with commercially available insulation materials (heat-resistant to 100 °C or more, thickness of 12 mm or more).
- The indoor parts of the drain pipe should be wrapped with polyethylene foam insulation materials (specific gravity of 0.03, thickness of 9 mm or more).
- Apply thin layer of refrigerant oil to pipe and joint seating surface before tightening flare nut.
- Use two wrenches to tighten piping connections.
- Use refrigerant piping insulation provided to insulate indoor unit connections. Insulate carefully.

(A) Flare cutting dimensions

Copper pipe O.D. (mm)	Flare dimensions øA dimensions (mm)
ø6.35	8.7 - 9.1
ø9.52	12.8 - 13.2
ø12.7	16.2 - 16.6
ø15.88	19.3 - 19.7
ø19.05	22.9 - 23.3

4.2. Positioning refrigerant and drain piping

- Position of refrigerant and drain piping (Fig. 4-2)
- Determine the position of the knockout holes on the unit body (Fig. 4-3)
 - Make the knockout holes using a saw blade or an adequate knife.

⚠ Caution:

The side panel must be removed before drilling a knockout hole in it. If a hole is made with the side panel in place, the refrigerant pipe within the unit could be damaged.

(3) L-shaped connection pipe (for gas piping) (Fig. 4-4)

- (A) 107 mm (P63), 102 mm (P100)
- (B) Drain hose
- (C) Liquid pipe
- (D) Gas pipe
- (E) Drain hose in left-side piping
- (F) Knockout holes on the unit body
- (G) For left-side piping
- (H) For lower-side piping
- (I) For right-side piping
- (J) L-shaped connection pipe (option)
- (K) Unit side
- (L) On-site piping side
- (M) Piping

4.3. Refrigerant piping (Fig. 4-5)

1) Indoor unit

⚠ Caution:

Before connecting right, lower, left or left rear piping, connect the supplied L-shaped connection pipe (B) to the on-site piping.

5. Drainage piping work (Fig. 5-1)

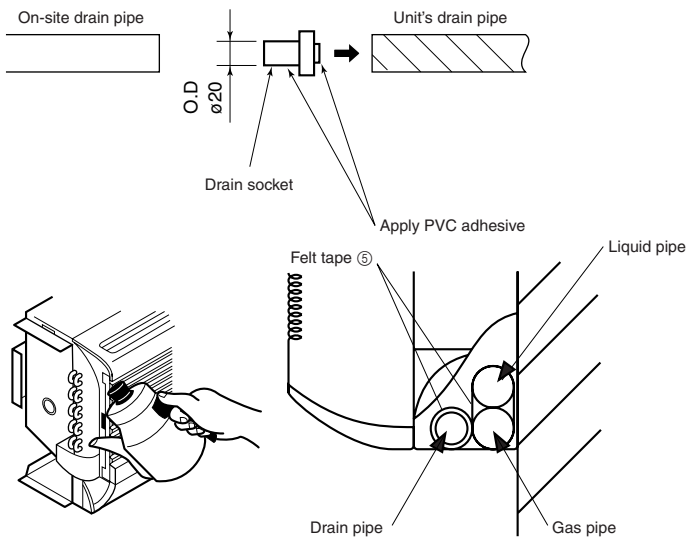


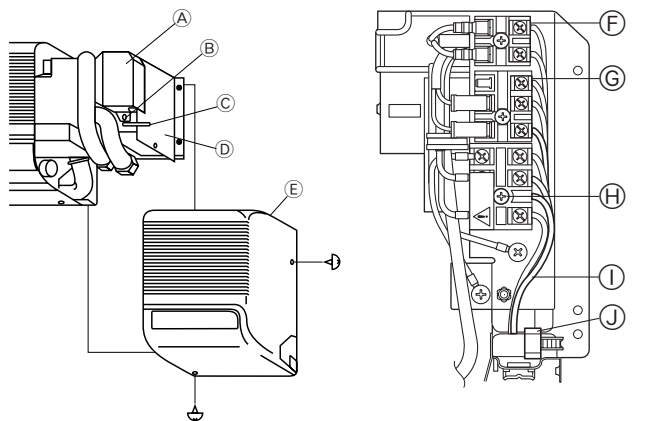
Fig. 5-1

- Drain pipes should have an inclination of 1/100 or more.
- Use PVC pipe VP-20 (O.D. ø26 PVC TUBE) for drain piping.
- Drain pipes can be cut with a knife at the connection point according to the on-site conditions.
- When connecting the VP-20, use adhesive to attach the supplied drain socket.
- To prevent dripping condensation, put felt tape ⑤ over the insulation materials on the refrigerant and drain pipes within the unit as shown in the diagram.

⚠ Caution:

The drain pipe should be installed according to this Installation Manual to ensure correct drainage. Thermal insulation of the drain pipes is necessary to prevent condensation. If the drain pipes are not properly installed and insulated, condensation may drip on the ceiling, floor or other possessions.

6. Electrical work



- | | |
|--|---|
| (A) Terminal block cover | (F) Terminal block for MA Remote controller |
| (B) Securing screw on the terminal block cover | (G) Terminal block for transmission |
| (C) Wire fastening band | (H) Terminal block for power supply |
| (D) Printed circuit board cover | (I) Power supply wiring & connection wiring |
| (E) Right side panel | (J) Cord clamp |

Fig. 6-1

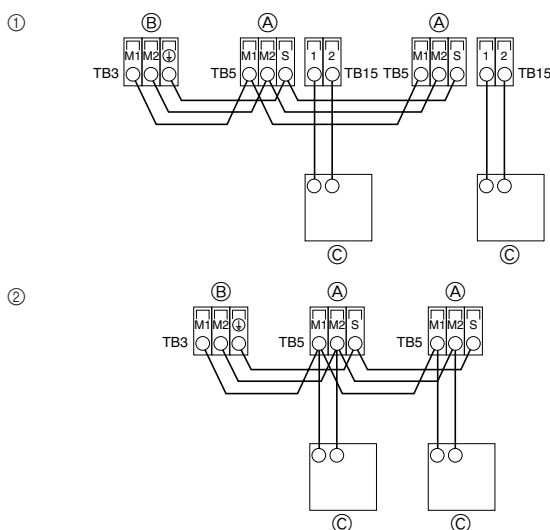


Fig. 6-2

6.1. Indoor unit (Fig. 6-1)

① Remove the right side panel.

To do this, remove the screws on the lower and right sides.

Remove the securing screw on the terminal block cover to take away the cover.

- The top end is hanging on a catch. Slide the cover to the right and upward for removal.

② Connect the power line, control line from the outdoor unit, and remote control lines.

After connecting, secure the wires with the cable band.

▶ Fix power source wiring to control box using buffer bushing for tensile force. (PG connection or the like.)

- Since the electric box may need to be pulled out for servicing or other occasions, wires must have enough slack.
- Class 3 grounding work must be conducted (grounding wire diameter: 1.6 mm or more)

After wiring is completed, reinstall the parts in the reverse order of removal.

Note:

- Power supply codes of appliance shall not be lighter than design 245 IEC 53 or 227 IEC 53.
- Install an earth longer and thicker than other cables.
- Power cable size: more than 1.5 mm².
- A means for the disconnection of the supply with an isolation switch, or similar device, in all active conductors shall be incorporated in the fixed wiring.
- Selecting non-fuse breaker (NF) or earth leakage breaker (NV).
- A switch with at least 3 mm contact separation in each pole shall be provided by the air conditioner installation.

⚠ Warning:

Wiring should be done so that the power lines are not subject to tension. Otherwise, heat may be generated or fire may occur.

6.2. Connecting remote controller, indoor and outdoor transmission cables (Fig. 6-2)

- Connect indoor unit TB5 and outdoor unit TB3. (Non-polarized 2-wire)
The "S" on indoor unit TB5 is a shielding wire connection. For specifications about the connecting cables, refer to the outdoor unit installation manual.
- Install a remote controller following the manual supplied with the remote controller.
- Connect the remote controller's transmission cable within 10 m using a 0.75 mm² core cable. If the distance is more than 10 m, use a 1.25 mm² junction cable.

① MA Remote controller

- Connect the "1" and "2" on indoor unit TB15 to a MA remote controller. (Non-polarized 2-wire)
- DC 9 to 13 V between 1 and 2 (MA remote controller)

② M-NET Remote controller

- Connect the "M1" and "M2" on indoor unit TB5 to a M-NET remote controller. (Non-polarized 2-wire)
- DC 24 to 30 V between M1 and M2 (M-NET remote controller)

- Ⓐ Terminal block for indoor transmission cable
- Ⓑ Terminal block for outdoor transmission cable
- Ⓒ Remote controller

6. Electrical work

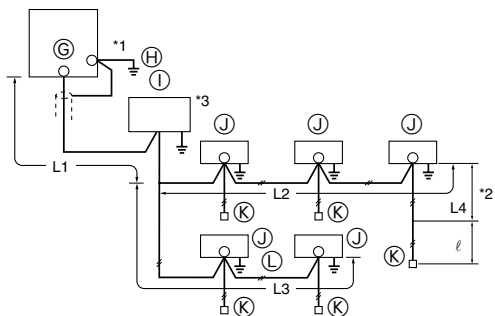


Fig. 6-3

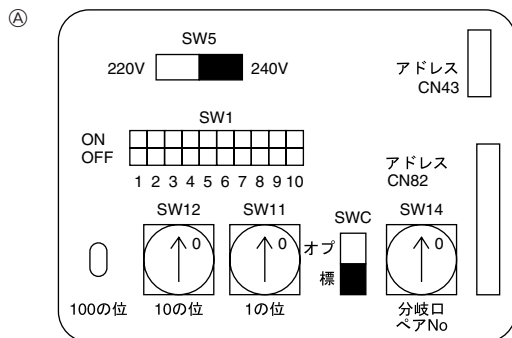


Fig. 6-4

Constraints on transmission cable (Fig. 6-3)

Longest wiring length ($L1+L2+L4$ or $L1+L3$ or $L2+L3+L4$): less than 200 m

Length between indoor unit and remote controller (l): within 10 m

- Ⓒ Outdoor unit
- Ⓓ Earth
- Ⓔ BC controller
- Ⓕ Indoor unit
- Ⓖ M-NET Remote controller
- Ⓗ Non-polarized 2-wire

Note:

*1 Put the transmission cable earth via the outdoor unit's earth terminal (Ⓓ) to the ground.

*2 If the remote controller cable exceeds 10 m, use a 1.25 mm² diameter cable over the exceeded portion, and add that exceeded portion to within 200 m.

*3 The BC controller is required only for simultaneous cooling and heating series R2.

6.3. Setting addresses (Fig. 6-4)

(Be sure to operate with the main power turned OFF.)

- There are two types of rotary switch setting available: setting addresses 1 to 9 and over 10, and setting branch numbers.

Note:

Please set the switch SW5 according to the power supply voltage.

- Set SW5 to 240 V side when the power supply is 230 and 240 volts.
- When the power supply is 220 volts, set SW5 to 220 V side.

Ⓐ Address board

6.4. Types of control cables

1. Wiring transmission cables: Shielding wire CVVS or CPEVS

- Cable diameter: More than 1.25 mm²

2. M-NET Remote control cables

Kind of remote control cable	Shielding wire MVVS
Cable diameter	More than 0.5 to 1.25 mm ²
Remarks	When 10 m is exceeded, use cable with the same specifications as transmission line wiring.

3. MA Remote control cables

Kind of remote control cable	2-core cable (unshielded)
Cable diameter	0.3 to 1.25 mm ²

7. Test run

7.1. Before test run

- ▶ After completing installation and the wiring and piping of the indoor and outdoor units, check for refrigerant leakage, looseness in the power supply or control wiring, wrong polarity, and no disconnection of one phase in the supply.
- ▶ Use a 500-volt megohmmeter to check that the resistance between the power supply terminals and ground is at least 1.0 MΩ.

- ▶ Do not carry out this test on the control wiring (low voltage circuit) terminals.

⚠ Warning:

Do not use the air conditioner if the insulation resistance is less than 1.0 MΩ.
Insulation resistance

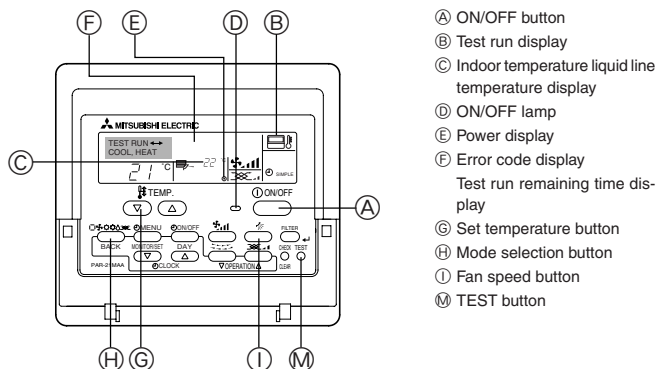


Fig. 7-1

7.2. Test run

The following 3 methods are available.

7.2.1. Using wired remote controller (Fig. 7-1)

- ① Turn on the power at least 12 hours before the test run.
- ② Press the [TEST] button twice. ⇒ "TEST RUN" liquid crystal display
- ③ Press the [Mode selection] button. ⇒ Make sure that wind is blown out.
- ④ Press the [Mode selection] button and switch to the cooling (or heating) mode. ⇒ Make sure that cold (or warm) wind is blown out.
- ⑤ Press the [Fan speed] button. ⇒ Make sure that the wind speed is switched.
- ⑥ Check operation of the outdoor unit fan.
- ⑦ Release test run by pressing the [ON/OFF] button. ⇒ Stop
- ⑧ Register a telephone number.

The telephone number of the repair shop, sales office, etc., to contact if an error occurs can be registered in the remote controller. The telephone number will be displayed when an error occurs. For registration procedures, refer to the operation manual for the indoor unit.

Note:

- If an error code is displayed on the remote controller or if the air conditioner does not operate properly, refer to the outdoor unit installation manual or other technical materials.
- The OFF timer is set for the test run to automatically stop after 2 hours.
- During the test run, the time remaining is shown in the time display.
- During the test run, the temperature of the indoor unit refrigerant pipes is shown in the room temperature display of the remote controller.
- When the VANE or LOUVER button is pressed, the message "NOT AVAILABLE" may appear on the remote controller display depending on the indoor unit model, but this is not a malfunction.

This product is designed and intended for use in the residential,
commercial and light-industrial environment.

The product at hand is based on the following EU regulations:

- Low Voltage Directive 73/23/ EEC
- Electromagnetic Compatibility Directive 89/336/ EEC

Please be sure to put the contact address/telephone number on
this manual before handing it to the customer.